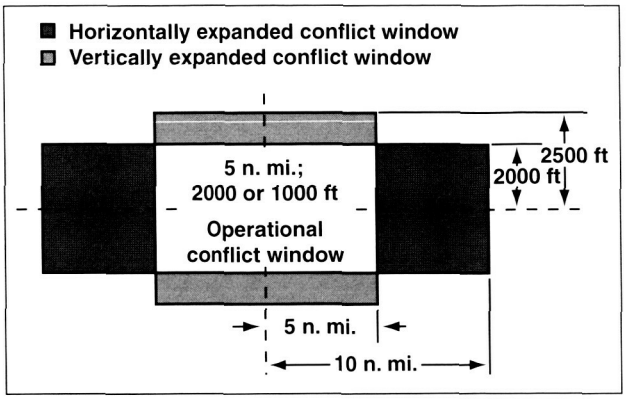

Fig. 2. Examples of expanded conflict windows.

amendments), and to appropriately adjust missed- and false-alert rates for those cases.

Preliminary results indicate that overall conflict probe performance is dependent on conflict geometry distributions and on the parameters of the expanded conflict windows. It is expected that the final results will provide guidelines for the performance that can be expected from a conflict probe based on current technology for aircraft tracking and weather prediction.

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Collaborative Arrival Planning

Rick Zelenka

The continued expansion of air-traffic and air-carrier economic pressures is necessitating changes in the relationship between the air traffic control service provider and the system user. Such pressures have resulted in efforts to increase the flexibility of air traffic management operations and allow collaboration between the service provider and system user. The government/industry "free-flight" initiative, whose ultimate vision is to allow users to select their own flightpath and speed in real time with air traffic control (ATC) imposing restrictions only when necessary, is the most visible of such efforts. Shared decision making and collaboration between system users and service providers have been identified as providing benefits necessary to support subsequent phases of free flight.

In the terminal arrival phase of flight, many restrictions and a high degree of control are placed on system users without regard for individual user operational preferences. Air traffic procedures do not allow the system users to prioritize their arrival sequence. For example, in hub operations, airlines may have preferences based on ensuring connections to overseas flights or gate availability that significantly affect their economics of operation.

The Collaborative Arrival Planning (CAP) service-provider/system-user decision-support tools should increase air traffic management flexibility and increase the economic efficiencies for system users. CAP is an extension of the Center/TRACON (Terminal Radar Approach Control) Automation System (CTAS), a suite of decision-support tools that provide computer-generated advisories for both en route and terminal-area controllers to manage and control arrival traffic more efficiently. CTAS has been selected by the Federal Aviation Administration (FAA) for national deployment. CTAS CAP will allow the user to request and influence intra-airline arrival characteristics without negatively affecting ATC operations. A tactical CAP tool will assist and improve the handling of individual aircraft arrival preferences. The strategic CAP tool will alter the CTAS arrival sequence within an individual airline's planned arrivals based on relative priority without affecting the priorities of other carriers.

Specific CAP accomplishments during FY97 include the following:

1. The design and development of a specialized airline CTAS "repeater" system. This system shares the CTAS arrival scheduling and airspace management information with the airspace user. Such real-time sharing of scheduling information is a significant first step in airspace user and service-provider collaboration and more efficient airline operations.

2. The design and development of a simulated airline "hub management" workstation to support the

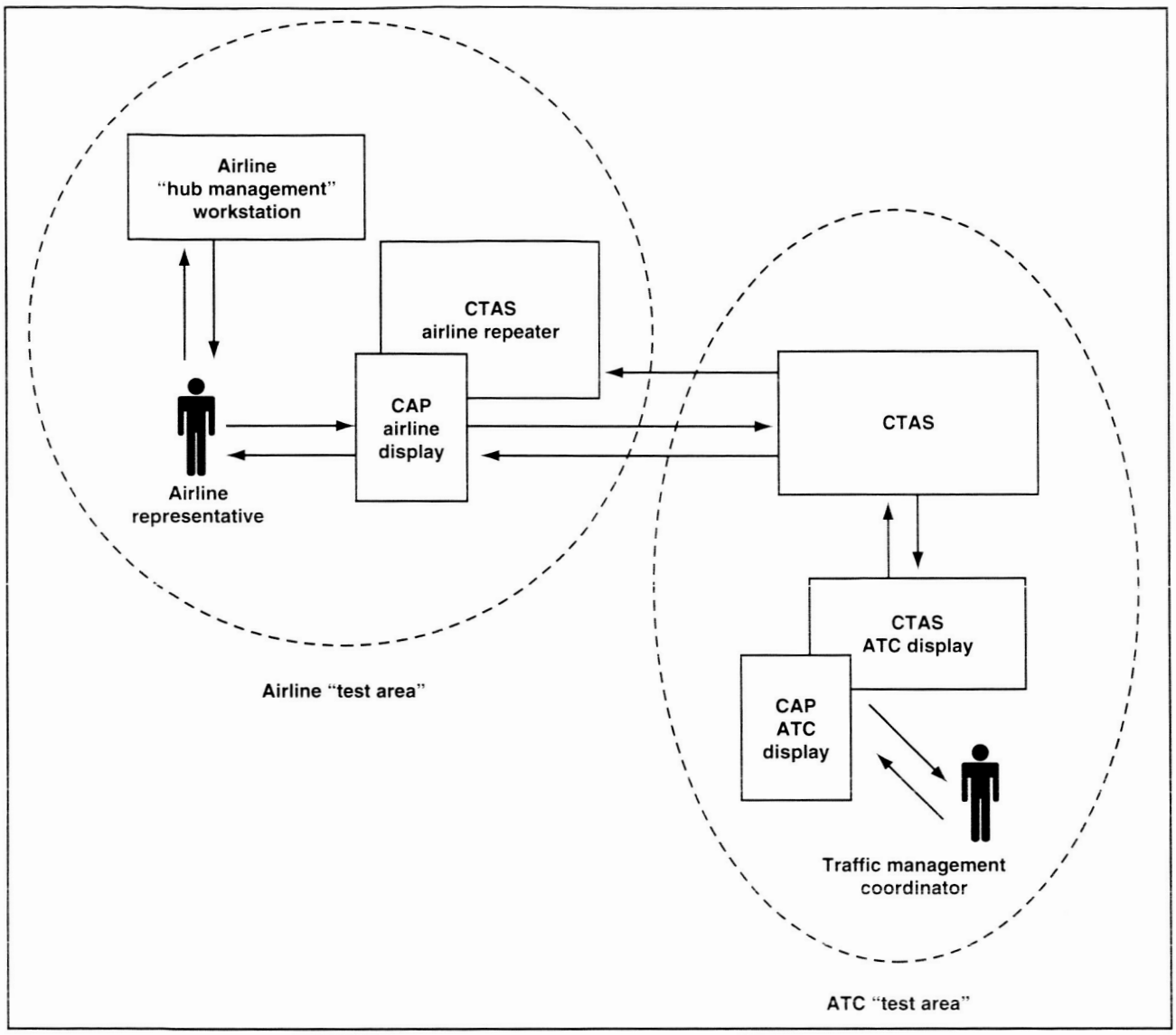

Fig. 1. Collaborative Arrival Planning (CAP) decision-support tool laboratory development environment.

laboratory development of CAP decision-support tools (see figure). The workstation presents a "gant chart" display of arriving and departing aircraft sorted by airport gate, as typically used by "hub-and-spoke" air carriers in their hub airport ramp towers.

3. A unique three-party memorandum of agreement (MOA) between NASA, the FAA, and airline participants. The MOA will allow the installation of the CTAS repeater system at airlines operating in the Dallas/Fort Worth area, the location of NASA CTAS field testing.

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